

## STUDY METHODS

Per capita health spending estimates cannot be directly constructed from currently available state-of-provider spending.<sup>1</sup> State-of-provider estimates reflect spending for services delivered in that state to residents and nonresidents, while the population estimates used to construct per capita estimates are based on residency. Using interstate border-crossing expenditure flow patterns, we adjusted the provider-based data to estimate health spending based on state of residence.

### **Provider-based estimates**

First, we estimated state health care spending by location of provider.<sup>2</sup> We relied heavily on economic census information (available by state once every five years), Internal Revenue Service state tabulations of receipts of for-profit health care businesses, the American Hospital Association's Annual Survey of Hospitals, and prescription drug sales collected by IMS, as well as other data on population, wages and salaries, and payers' expenditures.

### **Beneficiary-based estimates**

Next, we adjusted state expenditures from a provider to a beneficiary-residence basis. We separated our provider-based estimates into three payer components: Medicaid, Medicare, and all other payers. Medicaid spending estimates were based on state data provided by the agencies that pay health care costs for eligible residents. Because states do not pay Medicaid benefits for nonresidents and because almost all care paid for by Medicaid is provided by in-state providers, we assume that Medicaid spending by state is identical on a residence and provider basis.

For Medicare, we adjusted spending from a provider to a beneficiary-residence basis using Medicare claims data. Medicare is the only nationwide insurer with publicly available claims files containing a large pool of service-specific records upon which to base interstate flows of spending between providers' and beneficiaries' residence locations.

Generally, Medicare fee-for-service claims data are also used to adjust non-Medicare, non-Medicaid expenditures, although the specific procedures vary depending on the service category. For example, for inpatient hospital and physician services, we know that travel patterns differ between Medicare and non-Medicare, non-Medicaid populations. These differences primarily reflect differences in the age distributions of each population and the fact that different age cohorts tend to consume varying mixes of specific procedures and services.<sup>3</sup> Thus, Medicare expenditure flows are reweighted, using private hospital discharge information and physician claims records, to account for the distinct bundle of specific inpatient hospital and physician procedures purchased

by the privately insured population under age sixty-five.<sup>4</sup> Then, non-Medicare, non-Medicaid spending based on location of provider is adjusted to a state-of-residence basis using the reweighted Medicare expenditure flow patterns.

For most other services, no other private sources are available to adjust the Medicare data for service-mix. For services where Medicare pays benefits, Medicare interstate flows are used as a proxy for non-Medicare spending flows. The analysis of Medicare spending flows shows that interstate travel for other services is small. For some services (such as prescription drugs and dental services) Medicare data are unavailable, and thus no adjustment is made.

### **Caveats**

Because of data limitations, these state estimates do not adjust for international flows of health care spending. Health purchases in the United States by residents of other countries have the potential to overstate health spending in certain states, while purchases by U.S. residents in other countries would understate spending.<sup>5</sup> In addition, resident population estimates from the U.S. census do not adjust for the population undercount, which could overstate per capita spending to varying degrees in different states.

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<sup>1</sup> A. Martin, L. Whittle, and K. Levit, "Trends in State Health Care Expenditures and Funding: 1980-1998," *Health Care Financing Review* 22, no. 4 (2001): 111-140. The data are also available online at [www.hcfa.gov/stats/nhe-oact/stateestimates](http://www.hcfa.gov/stats/nhe-oact/stateestimates).

<sup>2</sup> Ibid.

<sup>3</sup> Variations in travel patterns are attributable to differences in the mix of specific procedures and services purchased by various age cohorts within broader inpatient hospital and physician service categories, rather than to differences in travel patterns exhibited by each age cohort for the same procedure. Fu Associates, "Interstate Flows of Health Spending: Updates for 1992 and 1993" (Memorandums dated 8 October 1996, 7 November 1996, and 29 January 1997, Contract no. HCFA 500-95-0036, prepared for the Centers for Medicare & Medicaid Services, Baltimore, 1996).

<sup>4</sup> Inpatient hospital discharge information from Codman Research Group and claims records for private non-Medicare physician services from a large employer database were used to reweight expenditure flows to reflect the procedure-specific bundle of services used by the non-Medicare, non-Medicaid population. See J. Basu, "Border-Crossing Adjustment and Personal Health Care Spending by State," *Health Care Financing Review* 18, no. 1 (1996): 215-236 for further information on service-mix adjustments and using Medicare flows as proxies.

<sup>5</sup> A small percentage of U.S. citizens who are Medicare beneficiaries receive health care services (paid for by Medicare) outside of the fifty states, and a small percentage of U.S. citizens living in the U.S. territories and in other

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countries return to the United States for health care. The net flow of these travel patterns amounts to a net reduction of 0.1 percent in overall Medicare spending. Similar adjustments for the non-Medicare, non-Medicaid populations are not possible.